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Published:

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: MEDICAL USES OF INTERCELLULAR COMMUNICATION FACILITATING COMPOUNDS

(57) Abstract: Disclosed are novel peptides including antiarrhythmic peptides that have improved stability. Further disclosed are compositions that include such peptides and methods of using the compositions particularly as medicaments.



WO 02/077017 A3

INTERNATIONAL SEARCH REPORT

International Application No
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A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61K38/08 A61K38/04 C07K7/06 C07K7/64 C07K5/10
C07K5/08 C07K5/06 C07C237/22 A61K31/195 A61K31/05
A61K31/53 A61K31/4353 A61P1/00 A61P3/00 A61P7/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07K A61K C07C A61P

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, PAJ, BIOSIS, CHEM ABS Data, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X, L	WO 01 62775 A (HOLSTEIN RATHLOU NIELS HENRIK ;JOERGENSEN NIKLAS RYE (DK); LARSEN) 30 August 2001 (2001-08-30) the whole document	1-55,60, 61,63-92
X	DE 197 07 854 A (DHEIN STEFAN PRIV DOZ DR MED ;GROVER RAJIV DIPL CHEM (DE)) 3 September 1998 (1998-09-03) cited in the application the whole document	1-55,60, 61,63-92
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
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- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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- "&" document member of the same patent family

Date of the actual completion of the international search

28 March 2003

Date of mailing of the international search report

03. 07. 2003

Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 02/05773

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61P9/06 A61P11/00 A61P17/00 A61P19/00 A61P25/00
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Minimum documentation searched (classification system followed by classification symbols)

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Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DHEIN S ET AL: "THERAPEUTIC POTENTIAL OF ANTIARRHYTHMIC PEPTIDES CELLULAR COUPLING AS A NEW ANTIARRHYTHMIC TARGET" DRUGS, ADIS INTERNATIONAL LTD, AT, vol. 49, no. 6, 1995, pages 851-855, XP001034031 ISSN: 0012-6667 cited in the application the whole document ---	1-55,60, 61,63-92
X	WO 96 21674 A (BASF AG ;DHEIN STEFAN (DE); TUDYKA TATJANA (DE)) 18 July 1996 (1996-07-18) the whole document -----	1-55,60, 61,63-92

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- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

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Name and mailing address of the ISA

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Authorized officer

GROENENDIJK, M

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 02/05773

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0162775	A	30-08-2001	AU 3536201 A CA 2385659 A1 WO 0162775 A2 EP 1226160 A2 US 2003092609 A1	03-09-2001 30-08-2001 30-08-2001 31-07-2002 15-05-2003
DE 19707854	A	03-09-1998	DE 19707854 A1	03-09-1998
WO 9621674	A	18-07-1996	DE 19500990 A1 AU 4483696 A BR 9606756 A CA 2209496 A1 CN 1168142 A CZ 9702048 A3 WO 9621674 A1 EP 0805818 A1 FI 972965 A JP 11511727 T NO 973230 A ZA 9600239 A	18-07-1996 31-07-1996 06-01-1998 18-07-1996 17-12-1997 17-12-1997 18-07-1996 12-11-1997 11-07-1997 12-10-1999 11-07-1997 14-07-1997

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 02/05773

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

Although claims 24-55, 63-92 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-55, 63-92 PARTIALLY 60, 61

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-55,63-92(all partially);60,61

1.1. Claims: 1-55,63-92(all partially);60,61

Use of compounds of formula I (description page 49)
and tables 1 and 8 as far as covered by formula 1

1.2. Claims: 1-55,63-92(all partially)

Use of compounds of formula II and tables 1 and 8 as
far as covered by formula II

1.3. Claims: 1-55,63-92(all partially)

Use of compounds of formula III and tables 1 and 8 as
far as covered by formula III

1.4. Claims: 1-55,63-92(all partially)

Use of compounds of formula IV and tables 1 and 8 as
far as covered by formula IV

1.5. Claims: 1-55,63-92(all partially)

Use of compounds of formula V and tables 1 and 8 as
far as covered by formula V

2. Claims: 1-55,63-92(all partially)

Use of compounds of formula VI and tables 1 and 8 as far as
covered by formula VI

3. Claims: 1-55,62-92(all partially)

Use of compounds of formula VII and tables 1 and 8 as far as
covered by formula VII

4. Claims: 1-55,62-92(all partially)

Use of compounds of formula VIII and tables 1 and 8 as far
as covered by formula VIII

5. Claims: 52-55,63-86,88-92(all partially);56-59

Use of compounds as defined in claims 56-59

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Please note that all inventions mentioned under item 1, although not necessarily linked by a common inventive concept, could be searched without effort justifying an additional fee.